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washplus Weekly
Supportive Environments for Healthy Communities

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This Weekly presents the latest handwashing research summary from the Global Public-Private Partnership for Handwashing (PPPHW). Between April and June 2015, 17 relevant peer-reviewed handwashing studies were identified. The studies below discuss behavior change, the benefits of handwashing, and handwashing "hardware." A link is also provided to the January-March 2015 handwashing research summary.

The research summary below is also available as a pdf file for printing.

Measurement of Handwashing Behavior

One study in Bangladesh directly observed handwashing behavior and found that frequency of handwashing after defecation in 1,000 households was around 32 percent.[1] A study in India demonstrated that embedding electronic loggers in soap is an effective technique to observe handwashing behavior.[2] Two further surveys measured handwashing frequency through self-reporting: in Turkey, 91 percent of the general population reported "always" washing their hands after using the toilet, 67 percent before cooking, and 61 percent before eating. Women, older people, and more educated people were more likely to report doing so. The most common times for handwashing reported in that survey were after using the toilet, after waking up, after touching trash, and after picking the nose.[3] Meanwhile, 47 percent of farmers and veterinarians tending to farms in the United States and Thailand reported "always" washing their hands and 35 percent "sometimes" after contact with animals; their handwashing likelihood was not associated with the type of animal being farmed.[4]

Behavior Change

Knowledge

Three studies explicitly related knowledge to handwashing behavior. In Cambodia, if farmers understood the risk of animal-transmitted infections, they were more likely to wash their hands,[5] and in Nigeria, knowledge of Ebola transmission routes made people more likely to wash their hands (though when asked to demonstrate, only 2.2 percent of more than 5,000 people washed all parts of their hands).[6] However, in Ethiopia and Haiti knowledge about why to wash hands was associated with less frequent handwashing.[7]

Emotional Motivators

A study in Nigeria found 58 percent of people reported they started handwashing regularly in

response to fears of Ebola.[6] Another study found that the most effective psychological determinants for handwashing behavior in Haiti were coping planning (establishing plans to overcome anticipated barriers and distractions to a behavior), strength of commitment to handwashing, disgust, and social norms; in Ethiopia, the same study found the most effective determinants to be nurture, social norms, perception of risk severity of not washing hands, disgust, and self-efficacy. [7]

Link to Sanitation

Hygiene and defecation practices in India were found to be closely linked: a study of schoolchildren found latrine users were almost three times more likely to report using soap to cleanse their hands after defecation compared to children who sometimes or always defecate openly (52 percent vs. 17 percent).[8]

Implementation in Schools

A randomized controlled trial in Denmark assessed the feasibility and impact of implementing hygiene education and mandatory pre-lunch handwashing in 43 schools. The researchers found teachers were reluctant to integrate handwashing into their pre-existing lesson plans, and only a third of teachers supported the pre-lunch handwashing intervention. Almost half of teachers stated beliefs that the time needed for handwashing disrupted education, and that time taken for handwashing could be better spent teaching or eating lunch. Accessible and high-quality facilities, and designated handwashing time strongly influenced the likelihood of the handwashing intervention being implemented. Over the course of a year, despite buy-in and implementation challenges, the schoolchildren's self-reported frequency of handwashing before lunch increased from 56 percent to 70 percent.[9] Barriers were similar to those identified in the Turkey survey: forgetting, lack of convenient handwashing station, and having insufficient time.[3]

Handwashing "Hardware"

A cross-sectional survey of 526 schools in Nicaragua found 81 percent of schools had no handwashing stations and 74 percent of schools lacked soap; 95 percent of the schools that did have soap acquired it from parents of students, rather than through a dedicated budget.[10] In the Danish trial of school-based handwashing promotion, inconveniently located sinks and lack of soap and paper towels were identified as important barriers for implementing daily handwashing.[9] Indeed, a study in India looked at "hardware"-related determinants for handwashing and found that making soap available next to the toilet in households (in addition to at handwashing stations) increased the probability of overall daily handwashing with soap by 73 percent, and after using the toilet, probability of handwashing with soap increased by 172 percent.[2]

Installing low-cost portable handwashing stations in health care facilities in western Kenya proved to be a sustainable intervention, delivering an increase of adequate handwashing facilities from 53 percent at baseline to 79 percent after 18 months; furthermore, a modest increase in handwashing was observed in households located near these health care facilities.[11]

Cleansing Agents

Observation of 1,000 households in Bangladesh found that 19 percent of people cleaned their hands with soap, and a further 13 percent with ash/soil after defecation, and 27 percent of

caregivers cleaned their hands with soap, and a further 10 percent with ash/soil after cleaning a child who had defecated. There was a general perception that ash and soil are as effective as soap after fecal contact.[1] Meanwhile 61 percent of schoolchildren studied in Bihar, India, reported using soil, 36 percent soap, 1.9 percent ash, and 0.5 percent water only to wash their hands after using the toilet; choice of material varied by caste, with 53 percent of children from Caste 1 reporting exclusive use of soap for hand-cleaning compared with 21 percent of children from Castes 2 to 6, and 17 percent of Muslim children.[8]

Benefits of Handwashing

Intestinal Parasite Infection and Anemia

In Ethiopia, schoolchildren who received household interventions to promote handwashing with soap were 68 percent less likely to become infected by intestinal parasites than children left to continue with existing habits and practices.[12] A different study in India found that absence of a handwashing station at the schools was independently associated with A. lumbricoides infection.[8]

Influenza

In Spain, schoolchildren were less likely to develop influenza if they washed their hands more than five times a day and after touching contaminated surfaces; this effect was not seen in preschool children.[13] Another case control study in Bangladesh also found that preschool children's handwashing habits were not associated with their risk of influenza.[14]

Hepatitis A

An investigation of an outbreak of Hepatitis A in rural China found that the more people washed their hands, the less likely they were to develop Hepatitis A infection.[15]

Nutrition

An Ethiopian study found that children whose homes did not have a handwashing facility were more likely to be underweight than those whose households did have a handwashing facility[16]; the intestinal parasite study in Ethiopia found that schoolchildren who received household interventions to promote handwashing with soap were 61 percent less likely to be anemic.[12]

Phthalate Esters

Increasing frequency of handwashing was found to reduce urinary evidence of exposure to phthalate esters in Taiwanese girls.[17]

References

1. Nizame FA, Nasreen S, Halder AK, Arman S, Winch PJ, Unicomb L, Luby SP. Observed Practices and Perceived Advantages of Different Hand Cleansing Agents in Rural Bangladesh: Ash, Soil, and Soap. *Am J Trop Med Hyg*. 2015; 92(6):1111-6.

2. Wright RL, Zillmer R, Biran A, Hall P, Sidibe M. Use of Electronic Loggers to Measure Changes in the Rates of Hand Washing with Soap in Low-Income Urban Households in India. *PLoS ONE.* 2015; 10(6): e0131187.

3. Tüzün H, Karakaya K, Deniz EB. Turkey Handwashing Survey: Suggestion for Taking the

Ecological Model into Better Consideration. *Environ Health Prev Med*. 2015 May 23.

4. Odo NU, Raynor PC, Beaudoin A, Somrongthong R, Scheftel JM, Donahue JG, Bender JB. Personal Protective Equipment Use and Handwashing among Animal Farmers: A Multi-Site Assessment. *J Occup Environ Hyg*. 2015 Jun; 12(6):363-8.

5. Osbjer K, Boqvist S, Sokerya S, Kannarath C, San S, Davun H, Magnusson U. Household Practices Related to Disease Transmission Between Animals and Humans in Rural Cambodia. *BMC Public Health*. 2015 May 9; 15:476.

6. Gidado S, Oladimeji AM, Roberts AA, Nguku P, Nwangwu IG, Waziri NE, Shuaib F, Oguntimehin O, Musa E,Nzuki C, Nasidi A, Adewuyi P, Daniel TA, Olayinka A, Odubanjo O, Poggensee G. Public Knowledge, Perception and Source of Information on Ebola Virus Disease - Lagos, Nigeria; September, 2014. *PLoS Curr.* 2015 Apr 8; 7. pii: ecurrents.outbreaks. 0b805cac244d700a47d6a3713ef2d6db.

7. Contzen N, Mosler HJ. Identifying the Psychological Determinants of Handwashing: Results from Two Cross-Sectional Questionnaire Studies in Haiti and Ethiopia. *Am J Infect Control*. 2015 May 28; pii: S0196-6553(15)00429-0.

8. Bonnesen CT, Plauborg R, Denbæk AM, Due P, Johansen A. Process Evaluation of a Multicomponent Intervention to Reduce Infectious Diseases and Improve Hygiene and Well-Being among School Children: The Hi Five Study. *Health Educ Res*. 2015;30(3):497-512.

9. Greenland K, Dixon R, Khan SA, Gunawardena K, Kihara JH, Smith JL, Drake L, Makkar P, Raman S, Singh S, Kumar S. The Epidemiology of Soil-Transmitted Helminths in Bihar State, India. *PLoS Negl Trop Dis.* 2015 May 20; 9(5):e0003790.

10. Jordanova T, Cronk R, Obando W, Medina OZ, Kinoshita R, Bartram J. Water, Sanitation, and Hygiene in Schools in Low Socio-Economic Regions in Nicaragua: A Cross-Sectional Survey. *Int J Environ Res Public Health*. 2015 May 29; 12(6):6197-217.

11. Bennett SD, Otieno R, Ayers TL, Odhiambo A, Faith SH, Quick R. Acceptability and Use of Portable Drinking Water and Hand Washing Stations in Health Care Facilities and their Impact on Patient Hygiene Practices, Western Kenya. *PLoS ONE*. 2015; 10(5): e0126916.

12. Mahmud MA, Spigt M, Bezabih AM, Pavon IL, Dinant GJ, Velasco RB. Efficacy of Handwashing with Soap and Nail Clipping on Intestinal Parasitic Infections in School-Aged Children: A Factorial Cluster Randomized Controlled Trial. *PLoS Med.* 2015; 12(6):e1001837.

13. Torner N, Soldevila N, Garcia JJ, Launes C, Godoy P, Castilla J, Domínguez A. CIBERESP Cases and Controls in Pandemic Influenza Working Group, Spain. Effectiveness of Non-Pharmaceutical Measures in Preventing Pediatric Influenza: A Case-Control Study. *BMC Public Health*. 2015; 15:543.

14. Doshi S, Silk BJ, Dutt D, Ahmed M, Cohen AL, Taylor TH, Brooks WA, Goswami D, Luby SP, Fry AM, Ram PK. Household-Level Risk Factors for Influenza among Young Children in Dhaka, Bangladesh: A Case-Control Study. *Trop Med Int Health*. 2015 Jun; 20(6):719-29.

15. Ping Yu, Lihong Huang, Hui Li, Mingbin Liu, Jun Zong, Chao Li, Feng Chen. Epidemiological

Investigation of an Outbreak of Hepatitis A in Rural China. *International Journal of Infectious Diseases*. 2015; 33:191-195.

16. Degarege D, Degarege A, Animut A. Undernutrition and Associated Risk Factors among School Age Children in Addis Ababa, Ethiopia. *BMC Public Health*. 2015; 15(1):375.

17. Chen CY, Chou YY, Lin SJ, Lee CC. Developing an Intervention Strategy to Reduce Phthalate Exposure in Taiwanese Girls. *Science of the Total Environment*. 2014; 517:125-131

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